CPC   COOPERATIVE PATENT CLASSIFICATION

Y02B   **INDEXING SCHEME RELATING TO CLIMATE CHANGE MITIGATION TECHNOLOGIES RELATED TO BUILDINGS, e.g. INCLUDING HOUSING AND APPLIANCES OR RELATED END-USER APPLICATIONS**

WARNING

Y02B 10/00   **Integration of renewable energy sources in buildings**

Y02B 10/10   . Photovoltaic [PV]
Y02B 10/12   . . Roof systems for PV cells
Y02B 10/14   . . PV hubs

Y02B 10/20   . Solar thermal
Y02B 10/22   . . Evacuated solar collectors
Y02B 10/24   . . Air conditioning or refrigeration systems

Y02B 10/30   . Wind power

Y02B 10/40   . Geothermal heat-pumps

Y02B 10/50   . Hydropower in dwellings

Y02B 10/60   . Use of biomass for heating

Y02B 10/70   . Hybrid systems
Y02B 10/72   . . Uninterruptible or back-up power supplies integrating renewable energies

Y02B 20/00   **Energy efficient lighting technologies**

Y02B 20/10   . Energy saving technologies for incandescent lamps
Y02B 20/12   . . Halogen lamps
Y02B 20/125   . . . High voltage halogen lamps
Y02B 20/14   . . Specially adapted circuits
Y02B 20/142   . . . for resonant dimming, e.g. by means of high frequency resonant bridges
Y02B 20/144   . . . for pulse modulation dimming
Y02B 20/146   . . . for phase control dimming
Y02B 20/148   . . . . for reverse phase control dimming

Y02B 20/16   . Gas discharge lamps, e.g. fluorescent lamps, high intensity discharge lamps [HID] or

molecular radiators

Y02B 30/00   **Energy efficient heating, ventilation or air conditioning [HVAC]**

Y02B 30/08   .   relating to domestic heating, space heating or domestic hot water heating or supply systems [DHW]

Y02B 30/10   . .   using boilers (not used, see subgroups)

Y02B 30/102   . . .   Condensing boilers

Y02B 30/104   . . . .   Moistening the combustion air with condensate from the combustion gases

Y02B 30/106   . . . .   Removing condensate from the heater

Y02B 30/108   . . .   Modular boilers, i.e. connecting different sections within a boiler or cascading multiple boilers

Y02B 30/12   . .   Hot water central heating systems using heat pumps

Y02B 30/123   . . .   Self contained heating units using heat pumps

Y02B 30/126   . . . .   combined with the use of heat accumulated in storage masses

Y02B 30/14   . .   Central heating systems having more than one heat source

Y02B 30/16   . .   Central heating systems using steam or condensate extracted or exhausted from steam engine plants

Y02B 30/18   . .   Domestic hot-water supply systems using recuperated or waste heat

Y02B 30/20   . .   Heat consumers: i.e. devices to provide the end user with heat

Y02B 30/22   . . .   Low temperature radiators: i.e. convectors, radiators or a mixture of both with increased heat-exchange surface being suitable for systems working with a low temperature heat transfer medium

Y02B 30/24   . . .   ceiling, wall or underfloor heating arrangements for being used in combination with water central heating system

Y02B 30/26   . . .   Radiant panels electrically heated

Y02B 30/28   . . .   Direct fired air heaters: i.e. the air being in direct contact with the exhaust gases of the burner

Y02B 30/50   .   Systems profiting of external/internal conditions (not used, see subgroups)

Y02B 30/52   . .   Heat recovery pumps, i.e. heat pump based systems or units able to transfer the thermal energy from one area of the premises or part of the facilities to a different one, improving the overall efficiency

Y02B 30/54   . .   Free-cooling systems (not used, see subgroups)

Y02B 30/542   . . .   Air based, e.g. mixed outside air and recirculation systems

Y02B 30/545   . . .   Cooling using dew point control and direct humidifiers

Y02B 30/547   . . .   Using energy from the ground by air circulation, e.g. "Canadian well"

Y02B 30/56   . .   Heat recovery units (not used, see subgroups)

Y02B 30/563   . . .   Air to air

Y02B 30/566   . . .   Water to water

Y02B 30/60   .   Other technologies for heating or cooling (not used, see subgroups)

Y02B 30/62   . .   Absorption based systems

Y02B 30/625   . . .   integrating combined heat and power generation [CHP] systems, i.e. trigeneration

Y02B 30/64   . .   Adsorption based systems

Y02B 30/66   . .   Magnetic cooling

Y02B 30/70	.	Efficient control or regulation technologies (empty, see subgroups)
Y02B 30/72	..	Electric or electronic refrigerant flow control
Y02B 30/74	..	Technologies based on motor control (not used, see subgroups)
Y02B 30/741	...	Speed regulation of the compressor
Y02B 30/743	...	Condensing pressure control
Y02B 30/745	...	Speed regulation of pumps in flow control systems
Y02B 30/746	...	Speed regulation of fans in flow control systems
Y02B 30/748	...	Speed regulation of fans and pumps in cooling towers
Y02B 30/76	..	Centralised control (not used, see subgroups)
Y02B 30/762	...	of heating or domestic hot water [DHW] systems
Y02B 30/765	...	of refrigeration machines, plants or systems, including combined heating and refrigeration systems or heat-pumps
Y02B 30/767	...	of air distribution systems
Y02B 30/78	..	Ventilation adapted to air quality
Y02B 30/80	.	Ultrasonic humidifiers
Y02B 30/90	.	Passive houses; Double facade technology (not used, see subgroups)
Y02B 30/92	..	with air flow into the conditioned premises or facilities
Y02B 30/94	..	Improving the thermodynamic properties of the premises or facilities
Y02B 40/00		**Technologies aiming at improving the efficiency of home appliances**
Y02B 40/10	.	Relating to domestic cooking (not used, see subgroups)
Y02B 40/12	..	Induction cooking in kitchen stoves (not used, see subgroups)
Y02B 40/123	...	Control circuit or coil power supply
Y02B 40/126	...	Coil arrangements
Y02B 40/14	..	Microwave ovens (not used, see subgroups)
Y02B 40/143	...	Control circuit or magnetron power supply
Y02B 40/146	...	Load impedance matching, e.g. by acting upon phase or frequency
Y02B 40/16	..	Improved cooking stoves (not used, see subgroups)
Y02B 40/163	...	Fuel efficient biomass cooking stoves
Y02B 40/166	...	Fuel efficient gas cooking stoves
Y02B 40/18	..	Solar cooking stoves or furnaces
Y02B 40/30	.	Relating to refrigerators or freezers (not used see subgroups)
Y02B 40/32	..	Motor speed control of compressors or fans
Y02B 40/34	..	Thermal insulation
Y02B 40/40	.	Relating to dish-washers (not used, see subgroups)
Y02B 40/42	..	Motor speed control of pumps
Y02B 40/44	..	Heat recovery e.g. of washing water
Y02B 40/46	..	Optimisation of water quantity, e.g. of hot water

Y02B 40/50	.	Relating to washing machines
Y02B 40/52	. .	Motor speed control of drum or pumps
Y02B 40/54	. .	Heat recovery, e.g. of washing water
Y02B 40/56	. .	Optimisation of water quantity
Y02B 40/58	. .	Solar heating

Y02B 40/70	.	Relating to laundry dryers (not used, see subgroups)
Y02B 40/72	. .	Motor speed control of drum or fans
Y02B 40/74	. .	Solar heating

Y02B 40/80	.	Related to vacuum cleaners (not used, see subgroups)
Y02B 40/82	. .	Motor speed or motor power consumption control
Y02B 40/84	. .	Motor overheating or overloading prevention

Y02B 40/90	.	Energy efficient batteries, ultracapacitors, supercapacitors or double-layer capacitors charging or discharging systems or methods specially adapted for portable applications

Y02B 50/00 **Energy efficient technologies in elevators, escalators and moving walkways**

Y02B 50/10	.	in elevators
Y02B 50/12	. .	Energy saving technologies
Y02B 50/122	. . .	by adapted call allocation
Y02B 50/125	. . .	by adapting the motion profile
Y02B 50/127	. . .	by control of auxiliary devices
Y02B 50/14	. .	Energy recuperation technologies
Y02B 50/142	. . .	with electrical storage
Y02B 50/144	. . .	with mechanical storage
Y02B 50/146	. . .	with pressure storage
Y02B 50/148	. . .	by delivering current to the grid for hydraulic elevators

Y02B 50/20	.	in escalators and moving walkways
Y02B 50/22	. .	Energy saving technologies
Y02B 50/225	. . .	by adapting the motion profile
Y02B 50/24	. .	Energy recuperation technologies

Y02B 60/00 **Information and communication technologies [ICT] aiming at the reduction of own energy use**

Y02B 60/10	.	Energy efficient computing
Y02B 60/12	. .	Reducing energy-consumption at the single machine level, e.g. processors, personal computers, peripherals, power supply
Y02B 60/1203	. . .	involving a plurality of components
Y02B 60/1207	. . .	acting upon the main processing unit

Y02B 60/121	. . . .	Low-power processors
Y02B 60/1214	. . . .	Performance modes
Y02B 60/1217	. . . .	Frequency modification
Y02B 60/1221	. . . .	Clock disabling
Y02B 60/1225	. . .	Access, addressing or allocation within memory systems or architectures, e.g. to reduce power consumption or heat production, or to increase battery life
Y02B 60/1228	. . .	Interconnection, or transfer of information or other signals between, memories, peripherals or central processing units
Y02B 60/1232	. . .	Acting upon peripherals
Y02B 60/1235	. . . .	the peripheral being a bus
Y02B 60/1239	. . . .	the peripheral being a memory control unit [MCU]
Y02B 60/1242	. . . .	the peripheral being a display
Y02B 60/1246	. . . .	the peripheral being disc or storage devices
Y02B 60/125	. . . . .	The peripheral being a CD-ROM unit
Y02B 60/1253	. . . .	the peripheral being a cursor control device
Y02B 60/1257	. . . .	the peripheral being a keyboard
Y02B 60/126	. . . .	the peripheral being a modem
Y02B 60/1264	. . . .	the peripheral being a PCMCIA card
Y02B 60/1267	. . . .	the peripheral being a printer
Y02B 60/1271	. . . . .	Data transfer to print units
Y02B 60/1275	. . .	Cooling means for computing equipment provided with thermal management
Y02B 60/1278	. . .	Power management
Y02B 60/1282	. . . .	Selective power distribution
Y02B 60/1285	. . . .	Controlling the supply voltage
Y02B 60/1289	. . . .	Monitoring user presence
Y02B 60/1292	. . . .	Battery monitoring
Y02B 60/1296	. . . .	Power strips aiming to energy efficient operation
Y02B 60/14	. .	Reducing energy-consumption by means of multiprocessor or multiprocessing based techniques, other than acting upon the power supply
Y02B 60/142	. . .	Resource allocation
Y02B 60/144	. . .	Scheduling
Y02B 60/146	. . .	Increasing resource utilisation, e.g. virtualisation, consolidation
Y02B 60/148	. . .	Load distribution
Y02B 60/16	. .	Reducing energy-consumption in distributed systems
Y02B 60/162	. . .	Delegation or migration
Y02B 60/165	. . .	Monitoring
Y02B 60/167	. . .	Resource sharing
Y02B 60/18	. .	Reducing energy consumption at software or application level
Y02B 60/181	. . .	Compilation
Y02B 60/183	. . .	Installation
Y02B 60/185	. . .	At application level, i.e. feedback, prediction, usage patterns
Y02B 60/186	. . .	Suspending or hibernating, performance or eco-modes, operating system support, e.g. advanced configuration and power interface [ACPI]

Y02B 60/188	. . .	Information retrieval in databases
Y02B 60/30	.	Techniques for reducing energy-consumption in wire-line communication networks
Y02B 60/31	. .	using reduced link rate, e.g. adaptive link rate, not involving auto-negotiation
Y02B 60/32	. .	using subset functionality
Y02B 60/33	. .	by selective link activation in bundled links
Y02B 60/34	. .	by operating in low-power or sleep mode
Y02B 60/35	. . .	specifically suitable for Ethernet, e.g. IEEE802.3az
Y02B 60/36	. . .	specifically suitable for DSL
Y02B 60/40	.	High level techniques for reducing energy-consumption in communication networks
Y02B 60/41	. .	by proxying, i.e. delegating network functionalities while in low-power mode, e.g. ECMA 393 standard
Y02B 60/42	. .	by energy-aware routing
Y02B 60/43	. .	by signaling and coordination, e.g. signaling reduction, link layer discovery protocol [LLDP], control policies, green TCP
Y02B 60/44	. . .	specifically suitable for Ethernet, e.g. IEEE802.3az
Y02B 60/45	. . .	specifically suitable for DSL
Y02B 60/46	. .	Application modification for reducing energy-consumption, e.g. green peer-to-peer,
Y02B 60/50	.	Techniques for reducing energy-consumption in wireless communication networks

Y02B 70/00   **Technologies for an efficient end-user side electric power management and consumption**

Y02B 70/10	.	Technologies improving the efficiency by using switched-mode power supplies [SMPS], i.e. efficient power electronics conversion (not used, see subgroups)
Y02B 70/12	. .	Power factor correction technologies for power supplies
Y02B 70/123	. . .	Passive technologies
Y02B 70/126	. . .	Active technologies
Y02B 70/14	. .	Reduction of losses in power supplies (not used, see subgroups)
Y02B 70/1408	. . .	Low frequency active rectification, i.e. from a low frequency AC grid or generator
Y02B 70/1416	. . .	Converters benefiting from a resonance, e.g. resonant or quasi-resonant converters (not used, see subgroups)
Y02B 70/1425	. . . .	in non-galvanically isolated DC/DC converters
Y02B 70/1433	. . . .	in galvanically isolated DC/DC converters
Y02B 70/1441	. . . .	in DC/AC or AC/DC converters
Y02B 70/145	. . . .	in AC/AC converters
Y02B 70/1458	. . .	Synchronous rectification (not used, see subgroups)
Y02B 70/1466	. . . .	in non-galvanically isolated DC/DC converters
Y02B 70/1475	. . . .	in galvanically isolated DC/DC converters
Y02B 70/1483	. . .	by using wide band gap based power semiconductors, i.e. power converters integrating silicon carbide [SiC], gallium nitride [GaN], gallium arsenide [GaAs] or diamond power switches

Y02B 70/1491	. . .	Other technologies for reduction of losses, e.g. non-dissipative snubbers, diode reverse recovery losses minimisation, zero voltage switching [ZVS], zero current switching [ZCS] or soft switching converters
Y02B 70/16	. .	Efficient standby or energy saving modes, e.g. detecting absence of load or auto-off
Y02B 70/30	.	Systems integrating technologies related to power network operation and communication or information technologies for improving the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as climate change mitigation technology in the buildings sector, including also the last stages of power distribution and the control, monitoring or operating management systems at local level (smart grids supporting the management or operation of end-user stationary applications in general, including technologies with no associated climate change mitigation effect Y04S 20/00)(not used, see subgroups)
Y02B 70/32	. .	End-user application control systems (not used, see subgroups)
Y02B 70/3208	. . .	characterised by the aim of the control (not used, see subgroups)
Y02B 70/3216	. . . .	General power management systems
Y02B 70/3225	. . . .	Demand response systems, e.g. load shedding, peak shaving
Y02B 70/3233	. . . .	The system entering an energy saving mode, i.e. sleep, low-power or standby modes
Y02B 70/3241	. . . .	Domotics or building automation systems
Y02B 70/325	. . . . .	involving home automation communication networks
Y02B 70/3258	. . .	characterised by the end-user application (not used, see subgroups)
Y02B 70/3266	. . . .	The end-user application being or involving home appliances
Y02B 70/3275	. . . . .	The home appliances being or involving heating ventilating or air conditioning [HVAC] units
Y02B 70/3283	. . . . .	The system involving the remote operation of lamps or lighting equipment
Y02B 70/3291	. . . .	The end-user application involving uninterruptible power supply [UPS] systems or standby or emergency generators (for uninterruptible power supply systems or standby or emergency generators in the last power distribution stages Y04S 20/12)
Y02B 70/34	. .	Smart metering supporting the carbon neutral operation of end-user applications in buildings (not used, see subgroups)
Y02B 70/343	. . .	Systems which determine the environmental impact of user behavior
Y02B 70/346	. . .	Systems which monitor the performance of renewable electricity generating systems, e.g. of solar panels

Y02B 80/00		**Architectural or constructional elements improving the thermal performance of buildings**
Y02B 80/10	.	Insulation
Y02B 80/12	. .	Slab shaped vacuum insulation
Y02B 80/14	. .	Slab shaped aerogel insulation
Y02B 80/20	.	Windows or doors
Y02B 80/22	. .	Glazing
Y02B 80/24	. . .	Vacuum glazing
Y02B 80/26	. . .	Other special glazing, e.g. aerogel

Y02B 80/28	. .	Wooden or plastic frames with extra insulation
Y02B 80/30	.	Roofs
Y02B 80/32	. .	Roof garden systems
Y02B 80/34	. .	Roof coverings with high solar reflectance
Y02B 80/40	.	Floors specially adapted for storing heat or cold
Y02B 80/50	.	Light dependent control systems for sun shading

Y02B 90/00   **Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation**

Y02B 90/10	.	Applications of fuel cells in buildings
Y02B 90/12	. .	Cogeneration of electricity with other electric generators
Y02B 90/14	. .	Emergency, uninterruptible or back-up power supplies integrating fuel cells
Y02B 90/16	. .	Cogeneration or combined heat and power generation, e.g. for domestic hot water
Y02B 90/18	. .	Fuel cells specially adapted to portable applications, e.g. mobile phone, laptop
Y02B 90/20	.	Systems integrating technologies related to power network operation and communication or information technologies mediating in the improvement of the carbon footprint of the management of residential or tertiary loads, i.e. smart grids as enabling technology in buildings sector (not used, see subgroups)(Smart grids supporting the management or operation of end-user stationary applications in general, including technologies with no associated climate change mitigation effect Y04S 20/00)
Y02B 90/22	. .	Systems characterised by the monitored, controlled or operated end-user elements or equipments (not used, see subgroups)
Y02B 90/222	. . .	the elements or equipments being or involving energy storage units, uninterruptible power supply [UPS] systems or standby or emergency generators involved in the last power distribution stages (energy storage units involved in power generation, transmissionor distribution Y04S 10/14; uninterruptible power supply systems or standby or emergency generators as end-user application Y04S 20/248)
Y02B 90/224	. . .	the elements or equipments being or involving protection elements, switches, relays or circuit breakers
Y02B 90/226	. . .	the elements or equipments being or involving power plugs, sockets, adapters or power strips
Y02B 90/228	. . .	the element or elements being a direct current power network, grid or distribution line
Y02B 90/24	. .	Smart metering mediating in the carbon neutral operation of end-user applications in buildings (not used, see subgroups)
Y02B 90/241	. . .	Systems characterised by remote reading
Y02B 90/242	. . . .	from a fixed location
Y02B 90/243	. . . .	from a mobile location
Y02B 90/244	. . . .	the remote reading system including mechanisms for turning on/off the supply
Y02B 90/245	. . .	Displaying of usage with respect to time, e.g. monitoring evolution of usage, relating usage to weather conditions

Y02B 90/246	. . .	Utility meters which are networked together, e.g. within a single building
Y02B 90/247	. . .	Retrofitting of installed meters
Y02B 90/248	. . .	Systems oriented to metering of generated energy or power
Y02B 90/26	. .	Communication technology specific aspects (not used, see subgroups)
Y02B 90/2607	. . .	Details of the transmission structure or support between the monitoring, controlling or managing units and monitored, controlled or operated electrical equipment (not used, see subgroups)
Y02B 90/2615	. . . .	using the power network as support for the transmission
Y02B 90/2623	. . . . .	using pulsed signals
Y02B 90/263	. . . . .	using modification of a parameter of the network power signal
Y02B 90/2638	. . . .	using a data transmission bus
Y02B 90/2646	. . . .	using phone lines
Y02B 90/2653	. . . .	using wireless data transmission
Y02B 90/2661	. . . . .	By means of mobile telephony
Y02B 90/2669	. . . .	using Internet
Y02B 90/2676	. . .	Aspects related to the treatment or conditioning of data or signals (not used, see subgroups)
Y02B 90/2684	. . . .	associated with communication via dedicated transmission supports
Y02B 90/2692	. . . .	associated with communication via the power transmission network